

Available online at [www.sciencedirect.com](http://www.sciencedirect.com)

ScienceDirect

journal homepage: [www.elsevier.com/locate/burns](http://www.elsevier.com/locate/burns)

# A survey of the use of propranolol in burn centers: Who, what, when, why



Michael Thomas LeCompte<sup>a,\*</sup>, Lisa Rae<sup>b,1</sup>, Steven Alexander Kahn<sup>b,c,2</sup>

<sup>a</sup> Vanderbilt University Medical Center 1121 Medical Center Drive Nashville, TN 37232-7175, USA

<sup>b</sup> Vanderbilt University Medical Center 1211 Medical Center Dr. VUH 11S Room 11234 Nashville, TN 37232-7175, USA

<sup>c</sup> University of South Alabama Medical Center 2451 Fillingim St, Suite 10-I Mobile AL 36617, USA

## ARTICLE INFO

### Article history:

Received 4 May 2016

Received in revised form

25 June 2016

Accepted 14 July 2016

### Keywords:

Propranolol

Burn

Hypermetabolic

Pediatric

Survey

Injury

## ABSTRACT

**Introduction:** Many burn centers utilize propranolol in both adult and pediatric burn patients to attenuate the hypermetabolic response related to thermal injury despite the relative paucity of data in adults compared to children. The purpose of this study was to identify practice patterns related to propranolol, for which groups it is being used, length of use, and the intended benefit.

**Methods:** A 17 question survey regarding the use of propranolol was distributed to burn centers listed in the ABA website with a link to provide anonymous responses.

**Results:** A 31% response rate was achieved. Results demonstrated 60.5% use propranolol while 39.5% do not. Use in both adult and pediatric patients was reported in 82% of centers. The majority of centers (60.8%) initiate propranolol in patients with >20% TBSA burns. The drug is continued while inpatient for most adults (43%) with only 10% continuing treatment up to 6 months vs. rates of 17.6% long term outpatient use in pediatric patients. Drug dosing ranged from 10 to 40 mg in adults and 0.1 mg/kg to 5 mg/kg in pediatric patients dosed twice daily to four times daily with 25% and 40% titrating the dose to a reduced heart rate respectively. Propranolol was felt to improve outcomes in 56% of responses while 39% were “unsure”.

**Conclusion:** The majority of centers use propranolol for both adult and pediatric patients despite the lack of randomized studies in adult populations. A wide variation of practice patterns highlights the need for further study in regard to patient outcomes, duration of therapy, and dosing to drive consensus guidelines.

© 2016 Elsevier Ltd and ISBI. All rights reserved.

\* Corresponding author at: 644 Williamsport Ct., Nashville, TN 37221, USA. Tel.: +1 502 523 5316.

E-mail addresses: [michal.t.lecompte@vanderbilt.edu](mailto:michal.t.lecompte@vanderbilt.edu) (M.T. LeCompte), [lisa.rae@vanderbilt.edu](mailto:lisa.rae@vanderbilt.edu) (L. Rae), [skahn@health.southalabama.edu](mailto:skahn@health.southalabama.edu) (S.A. Kahn).

<sup>1</sup> Tel.: +1 615 322 4590; fax: +1 615 343 4844.

<sup>2</sup> Tel.: +1 585 315 2059.

<http://dx.doi.org/10.1016/j.burns.2016.07.007>

0305-4179/© 2016 Elsevier Ltd and ISBI. All rights reserved.

## 1. Introduction

The hypermetabolic and physiologic disruption following thermal injury has been well studied and documented in the literature. Acute and chronic elevations in catecholamines and inflammatory mediators as well as hyperinsulinemia have been shown to persist long after injury [1,2], leading to peripheral lipolysis [3,4], protein catabolism and increased resting energy expenditure after injury [5]. This hypermetabolic response results in muscle wasting [5,6], organ dysfunction [2], immune deficiency [7], delayed wound healing [8], and prolonged recovery [9,10].

Use of propranolol, an alpha and non-selective beta blocker, to blunt the catecholamine surge and ameliorate the effects of the hypermetabolic response, has been described in pediatric populations [4,11,12]. Inhibition of the sympathetic response, and subsequent catabolic surge, results in a reduction in resting energy expenditure and cardiac work load [13,14]. The metabolic benefits of propranolol therapy result in a reduction in peripheral lipolysis [3,4], decreased free fatty acid production and prevention of hepatic steatosis [15], as well as decreased skeletal muscle wasting [11,16]. Long term follow-up of pediatric patients has even demonstrated improvements in cardiac function, resting energy expenditure, and body composition at up to 6–12 months post-injury [9]. Findings from these studies have led many burn centers and physicians to adopt the use of propranolol for its metabolic and physiologic benefits in pediatric and adult patients.

Although the benefits of propranolol therapy in pediatric patients are well documented, there is little published data reproducing these effects in adults. Some data exists demonstrating improved wound healing with a reduction in total burn surface area requiring skin grafting when treated with propranolol [8]. Other studies have demonstrated reductions in healing times and mortality for patients on pre-injury beta-blocker therapy when it was continued through the course of their hospital stay [17]. However, despite the relative paucity of data in adults, many burn centers are utilizing propranolol in both adult and pediatric patient populations, extrapolating the benefits demonstrated in pediatric patients to the adult population.

The purpose of this study was to evaluate the use of propranolol among various burn centers, since to date, no guidelines exist to direct its use in thermally injured patients. The main goals were to characterize how the drug is being used in order to increase the burn community's understanding of how their peers are utilizing the drug. In particular, the study was designed to elucidate how many centers are using propranolol, for which patient populations it was being used, the trigger for initiation, length of use, and the intended outcomes driving the decision to use it.

## 2. Materials and methods

An IRB approved survey (IRB#141195) with 17 questions related to the use of propranolol in the treatment of burn patients was created. This survey was distributed to 123 burn centers

electronically through e-mail with a link to provide responses. Study data were collected and managed using REDCap [18] (Research Electronic Data Capture) tools. The centers above were selected from the American Burn Association website program list based on those that had available email contact information. Responses were de-identified and reported in aggregate. A second invitation was sent to those who did not respond to the initial request after two weeks. The survey was left open for 45 days. In addition to characteristics of the burn center, questions investigating the use of propranolol, the target population, drug dosing, the length of treatment, intended effects or benefits of treatment and the perception of outcomes were included. Survey responses were tabulated and analyzed using descriptive statistics.

## 3. Results

Thirty-eight responses were obtained from the 123 surveys distributed, resulting in a 31% response rate. The average size and number of burn surgeons for each center are listed in Table 1. Results demonstrated that 23 centers (60.5%) reported the use of propranolol in the treatment of burn patients while 15 centers (39.5%) did not use it. Respondents that denied use were asked to clarify their reasons for not using the drug. "We do not think that it improves outcomes" was the most common response given, with a total 8 responses (53%). One survey participant chose the response "we only treat adults and do not think it applies to our population" as the reason they did not use propranolol.

The remainder of the survey examined, in greater detail, the treatment practices of the 23 centers that reported the regular use of propranolol. Of these centers, 19 (82%) reported that they use propranolol in both adult and pediatric patient populations. One center reported the use of propranolol in pediatric populations alone, while the remaining three centers reported that they used propranolol in adults only.

Variability was reported among centers with more than one practicing burn surgeon in the decision to use propranolol. Fifteen centers (62.5%) cited use among all of the providers in their practice while the remaining 8 centers reporting discordance among the practice patterns of their physicians. If the use of propranolol among burn center providers was less than 100%, they were asked to qualify the reasoning behind this discordance. "Unfamiliarity with the literature" and "we do not think it improves outcomes" were the responses given among 42.9% and 57.1% respectively.

**Table 1 – Demographics of the survey responses, total responses, and percent response rate for the study.**

Number surveyed	N = 123
Number of respondents	38 (31%)
Number that use propranolol	23 (60.5%)
Median annual admissions per center	367 (237–462 IQR)
Median number of surgeons per center	3
Number of centers treating adult and pediatric patients	19 (82%)

Download English Version:

<https://daneshyari.com/en/article/5636116>

Download Persian Version:

<https://daneshyari.com/article/5636116>

[Daneshyari.com](https://daneshyari.com)